PTO/SB/21 (09-04)
Approved for use through 07/31/2006. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

TRANSMITTAL FORM

(to be used for all correspondence after initial filing)

Total Number of Pages in This Submission

Application Number	10/695,529
Filing Date	10/27/2003
First Named Inventor	Przytula
Art Unit	2129
Examiner Name	Starks, Wilbert L.
Attorney Docket Number	HRL099

ENCLOSURES *(Check all that apply)*

- [x] Fee Transmittal Form
- [x] Fee Attached
- [ ] Amendment/Reply
  - [ ] After Final
  - [ ] Affidavits/declaration(s)
- [ ] Extension of Time Request
- [ ] Express Abandonment Request
- [ ] Information Disclosure Statement
- [ ] Certified Copy of Priority Document(s)
- [ ] Reply to Missing Parts/ Incomplete Application
  - [ ] Reply to Missing Parts under 37 CFR 1.52 or 1.53
- [ ] Drawing(s)
- [ ] Licensing-related Papers
- [ ] Petition
- [ ] Petition to Convert to a Provisional Application
- [ ] Power of Attorney, Revocation Change of Correspondence Address
- [ ] Terminal Disclaimer
- [ ] Request for Refund
- [ ] CD, Number of CD(s) _____
  - [ ] Landscape Table on CD
- [ ] After Allowance Communication to TC
- [ ] Appeal Communication to Board of Appeals and Interferences
- [x] Appeal Communication to TC **(Appeal Notice, Brief, Reply Brief)**
- [ ] Proprietary Information
- [ ] Status Letter
- [ ] Other Enclosure(s) (please Identify below):

Remarks

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT

Firm Name	Tope-McKay & Associates		
Signature			
Printed name	Cary Tope-McKay		
Date	03/23/2007	Reg. No.	41,350

CERTIFICATE OF TRANSMISSION/MAILING

I hereby certify that this correspondence is being facsimile transmitted to the USPTO or deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on the date shown below:

Signature			
Typed or printed name	Cary Tope-McKay	Date	03/23/2007

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Appl. No.	:	10/695,529	Confirmation No. 6407
Applicant	:	Krzysztof W. Przytula	
Filed	:	10/27/2003	
TC/A.U.	:	2129	
Examiner	:	Starks, Wilbert L.	
Docket No.	:	HRL099	
Customer No.:		28848	

For: "APPARATUS, METHOD, AND COMPUTER PROGRAM PRODUCT FOR CONVERTING DIAGNOSTIC FLOWCHARTS INTO DIAGNOSTIC PROBABILISTIC GRAPHS"

BRIEF ON APPEAL

Hon. Commissioner for Patents
Washington, D.C. 20231

Sir:

This is an appeal from the Final Rejection, dated August 23, 2006, for the above identified patent application, for which a Notice of Appeal was filed on January 23, 2007.

PLEASE NOTE: THE PARAGRAPH NUMBERS LISTED HEREIN ARE TAKEN FROM THE "PUBLISHED DOCUMENT" OF THE PATENT APPLICATION THAT CAN BE FOUND ON THE U.S. PATENT AND TRADEMARK OFFICE'S WEBSITE.

REAL PARTY IN INTEREST

The present application has been assigned to HRL Laboratories, LLC of Malibu, CA.

RELATED APPEALS AND INFERENCES

The Appellant is unaware of any other appeals or interferences related to the subject matter of this appeal.

STATUS OF CLAIMS

Claims 1-66 are pending in the Application. Claims 1-66 are under Final Rejection as a result of the Final Office Action dated August 23, 2006. The Appellant appeals from the rejection of Claims 1-66. The appealed claims are reproduced in the Claims Appendix.

STATUS OF AMENDMENTS

No claims have been amended subsequent to the final rejection.

SUMMARY OF CLAIMED SUBJECT MATTER

The present invention relates to the construction of diagnostic probabilistic models, and their derivation, and more particularly to a tool for converting diagnostic flowcharts into diagnostic probabilistic models. (See the Present Application, paragraph 2).

The present invention provides a method, a computer program product, and an apparatus for converting decision flowcharts into decision probabilistic graphs on a data processing system. The method comprises a set of steps to be performed on a data processing system. The computer program product comprises a set of computer operations encoded on a computer-readable medium. Additionally, the apparatus comprises a computer system including a processor, a memory coupled with the processor, an input coupled with the processor for receiving user input and

data input, and an output coupled with the processor for outputting display data. (See the Present Application, paragraph 10).

The operations performed by the invention, in a first aspect, include receiving a representation of a decision flowchart having evidence nodes, a root evidence node, and outcome nodes, as is claimed in Claims 1, 23, and 45. The outcome nodes are related to the evidence nodes by conclusion links, as is claimed in Claims 1, 23, and 45. A further operation of generating a probabilistic graph based on the decision flowchart is performed, as is claimed in Claims 1, 23, and 45. The probabilistic graph generated includes an aggregate outcome node having a plurality of outcome states, with each outcome state representing an outcome node of the decision flowchart, and a plurality of test nodes with each of the test nodes matching an evidence node in the decision flowchart, and each test state matching a conclusion link from the evidence node in the flowchart, as is claimed in Claims 1, 23, and 45. Causal links are created between the aggregate outcome node and the evidence nodes, as is claimed in Claims 1, 23, and 45. Two additional operations in this aspect include calculating a set of prior probabilities for the outcome states based on predetermined likelihoods; and determining conditional probabilities for all test states by examining dependencies of conclusion links on the outcome nodes in the decision flowchart, as is claimed in Claims 1, 23, and 45. (See the Present Application, paragraph 11).

In a further aspect of the invention, a representation of the decision flowchart is obtained as a Flowchart Markup Language (FCML) document containing the essence of the decision flowchart, as is claimed in Claims 2, 24, and 46. (See the Present Application, paragraph 12).

In a still further aspect, the graphical representation of the decision flowchart is a Bayesian Network (BN), as is claimed in Claims 3, 13, 25, 35, 47, and 57. (See the Present Application, paragraph 13).

In another aspect, in the operation of calculating a set of prior probabilities, an operation of generating a causal dependency table comprising a causal dependency of each test node on each outcome state is performed, as is claimed in Claims 4, 14, 26, 36, 48, and 48. (See the Present Application, paragraph 14).

In yet another aspect, the causal dependency table includes a separate column for each outcome node of the decision flowchart and a separate row for each evidence node of the decision flowchart; whereby aggregate entries of each column of the table traces a path from the root evidence node to a particular outcome node, as is claimed in Claims 5, 15, 27, 37, 49, and 59. (See the Present Application, paragraph 15).

In still another aspect, the operation of determining conditional probabilities further comprises an operation of generating, for each evidence node, a conditional probability table comprising the conditional probability of each test state given each outcome state, as is claimed in Claims 6, 16, 28, 38, 50, and 60. (See the Present Application, paragraph 16).

In another aspect, the invention includes an operation of outputting a model file for the probabilistic graph to an algorithmic engine for further processing, as is claimed in Claims 7, 17, 29, 39, 51, and 61. (See the Present Application, paragraph 17).

In a further aspect of the present invention, predetermined likelihoods are inputted based on observed statistics, as is claimed in Claims 8, 18, 30, 40, 52, and 62. (See the Present Application, paragraph 18).

In a still further aspect, the present invention comprises a further operation of determining a next piece of evidence to gather based on cost-of-evidence data, as is claimed in Claims 9, 19, 31, 41, 53, and 63. (See the Present Application, paragraph 19).

In yet another aspect, the present invention comprises an operation of generating a representation of the decision flowchart via graphing software for receipt in the receiving step, as is claimed in Claims10, 20, 32, 42, 54, and 64. (See the Present Application, paragraph 20).

In another aspect, the present invention comprises an operation of generating a user interface to accept user input to the algorithmic engine whereby the user can control the order in which evidence is collected, as is claimed in Claims 11, 21, 33, 43, 55, and 65. (See the Present Application, paragraph 21).

In a further aspect, the present invention comprises an operation of converting the graphical representation of the decision flowchart into a Bayesian network modeling program-specific file, as is claimed in Claims 12, 22, 34, 44, 56, and 66. (See the Present Application, paragraph 22).

GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

Issue 1 – Are Claims 1-66 patentable under 35 U.S.C. § 101, as being directed to statutory subject matter?

Issue 2 – Are Claims 1-66 patentable under 35 U.S.C. § 112, first paragraph, as enabling one of ordinary skill in the art to use the invention?

Issue 3 – Are Claims 1, 23, and 45 patentable under 35 U.S.C. § 112, first paragraph, as being fully enabled to operate as Appellant claims?

Issue 4 – Are Claims 2, 24, and 46 patentable under 35 U.S.C. § 112, first paragraph, as being fully enabled to operate as Appellant claims?

THE ARGUMENT

Issue 1 *– Are Claims 1-66 patentable under 35 U.S.C. § 101, as being directed to statutory subject matter?*

In the Final Office Action of August 23, 2006, the Examiner rejected Claims 1-66 as being unpatentable under 35 U.S.C. § 101, as being directed to non-statutory subject matter. The Appellant submits that the Examiner misinterpreted the claims and that Claims 1-66 comply with the requirements of 35 U.S.C. § 101. Please note that the claims listed below are not in numerical order, but rather are in an order corresponding to the Examiner's Final Rejection.

The Examiner's Contentions

The Examiner stated the invention as disclosed in Claims 1-66 is directed to non-statutory subject matter. The Examiner stated that none of the claims are limited to practical applications in the technological arts. The Examiner cited *In re Warmerdam*, 33 F.3d 1354, 31 USPQ2d 1754 (Fed. Cir. 1994), as controlling the 35 U.S.C. §101 issues on that point for reasons made clear by the Federal Circuit in *AT&T Corp. v. Excel Communications, Inc.*, 50 USPQ2d 1447 (Fed. Cir. 1999). Specifically, the Examiner stated that the Federal Circuit held that the act of:

> "...[T]aking several abstract ideas and manipulating them together adds nothing to the basic equation. *AT&T v.* Excel at 1453 quoting *In re Wammerdam, 33* F.3d 1354, 1360 (Fed. Cir. 1994)."

The Examiner concluded that the "decision flowchart" references are such abstract ideas. The Examiner continued by stating that he based his position upon guidance provided by the Federal Circuit in *In re Warmerdam*, as interpreted by *AT&T v. Excel*. The Examiner also stated that this set of precedents is within the same line of cases as the *Alappat-State Street Bank* decisions and is in complete agreement with those decisions. The Examiner concluded that *In re Warmerdam* is consistent with the *State Street Bank* decision, holding that:

> "Today we hold that the transformation of data, representing discrete dollar amounts, by a machine through a series of mathematical calculations into a final share price, constitutes a practical application of a mathematical algorithm, formula, or calculation because it produces 'a useful, concrete and tangible

> result' -- a final sham price momentarily fixed for recording purposes and even accepted and relied upon by regulatory authorities and in subsequent trades. (emphasis added). *State Street Bank* at 1601."

The Examiner further stated that the case later eliminated the "business method exception" in order to show that business methods were not per se nonstatutory, but that the court clearly did not go so far as to make business methods per se statutory. The Examiner also stated that a reading of the excerpt above shows that the Court was very specific in its definition of the new practical application, as it defined the practical application in the case as "...the transformation of data, representing discrete dollar amounts, by a machine through a series of mathematical calculations into a final share price..." The Examiner concluded by stating that the "The court was being very specific."

The Examiner remarked that the court was also careful to specify that the "useful, concrete and tangible result" it found was "a final share price momentarily fixed for recording purposes and even accepted and relied upon by regulatory authorities and in subsequent trades." (i.e. the Examiner stated that the trading activity is the further practical use of the real world result). The Examiner also stated that the Appellant does not specify the associated practical application with the kind of specificity that the Federal Circuit used.

Furthermore, the Examiner stated that in the case of *In re Warmerdam*, the Federal Circuit held that:

> "...The dispositive issue for assessing compliance with Section 101 in this case is whether the claim is for a process that goes beyond simply manipulating 'abstract ideas' or 'natural phenomena' ... As the Supreme Court has made clear, '[a]n idea of itself is not patentable, ... taking several abstract ideas and manipulating them together adds nothing to the basic equation..'" *In re Warmerdam*, 31 USPQ2d at 1759.

From this citation, the Examiner concluded that since the Federal Circuit held in *In re Warmerdam* that this is the "dispositive issue" when it judged the

usefulness, concreteness, and tangibility of the claim limitations in that case. The Examiner in the present case viewed this holding as the dispositive issue for determining whether a claim is "useful, concrete, and tangible" in similar cases. Accordingly, the Examiner found that the Appellant manipulated a set of abstract "decision flowcharts" to solve purely algorithmic problems in the abstract.

With respect to the claims, the Examiner stated that since the claims are not limited to exclude such abstractions, the broadest reasonable interpretation of the claim limitations includes such abstractions. Therefore, the Examiner concluded that the claims are impermissibly abstract under the 35 U.S.C. §101 doctrine.

Further, the Examiner stated that since *In re Warmerdam* is within the *State Street Bank* line of cases, it takes the same view of "useful, concrete, and tangible" that the Federal Circuit applied in *State Street Bank.* Therefore, the Examiner concluded that under *State Street Bank,* the present invention does not provide a "useful, concrete and tangible result," and that the present invention only manipulates abstract ideas.

The Examiner also asserted that the Federal Circuit validated the use of *In re Warmerdam* in its more recent *AT&T Corp.* v. *Excel Communications, Inc.* decision. The Examiner stated that the Court further stated that:

> "Finally, the decision in *In re Warmerdam*, 33 F.3d 1354, 31 USPQ2d 1754 (Fed. Cir. 1994) is not to the contrary. *** The court found that the claimed process did nothing more than manipulate basic mathematical constructs and concluded that 'taking several abstract ideas and manipulating them together adds nothing to the basic equation'; hence, the court held that the claims were properly rejected under §101 ... Whether one agrees with the court's conclusion on the facts, the holding of the case is a straightforward application of the basic principle that mere laws of nature, natural phenomena, and abstract ideas are not within the categories of inventions or discoveries that may be patented under §101." *AT&T Corp.* v. *Excel Communications, Inc.*, 50 USPQ2d 1447, 1453 (Fed. Cir. 1999).

The Examiner also stated that the Court in *In re Warmerdam* stated that this was the dispositive issue to be considered. The Examiner further stated that in the *AT&T* decision cited above, the Court reaffirmed that this is the issue for assessing the "useful, concrete, and tangible" nature of a set of claims under the 101 doctrine. Accordingly, the Examiner viewed the *In re Warmerdam* holding as dispositive with regard to this case.

Thus, the Examiner again concluded that the present invention is merely the manipulation of abstract ideas. The Examiner further concluded that the data referred to by the phrase "decision flowchart" is simply an abstract construct that does not provide limitations in the claims to the transformation of real world data (such as monetary data or heart rhythm data) by some disclosed process. Therefore, the Examiner concluded that the claims take several abstract ideas (i.e., "decision flowcharts" in the abstract) and manipulate them together, adding nothing to the basic equation. Based on that, the Examiner rejected Claims 1-66 under 35 U.S.C. §101.

The Appellant's Response

The Appellant vehemently disagrees with the Examiner's conclusions and contends that Claims 1-66 are patentable under §101. More specifically, for the following reasons, the Appellant believes that Claims 1-66 produce a "useful, concrete, and tangible" result.

a. This is a *State Street Bank* and *AT&T v. Excel* analysis and NOT an *In re Warmerdam* anaylysis

The Examiner erroneously relies on the *In re Warmerdam* case in analyzing the facts as pertinent to the Present Application.

First, *In re Warmerdam* is not relied upon by *State Street Bank* for the proposition of "useful, concrete, and tangible," as argued by the examiner. Rather, the *In re Warmerdam* reference in *State Street Bank* is cited for the proposition that,

"Section 101 specifies that statutory subject matter must also satisfy the other 'conditions and requirements' of Title 35, including novelty, nonobviousness, and adequacy of disclosure and notice." *State Street Bank* at 1602. Thus, contrary to the Examiner's contentions, the *State Street Bank* does not validate the Court's holding in *In re Warmerdam* with respect to what constitutes a "useful, concrete, and tangible" result.

Second, the basic holdings in *State Street Bank* (the more recent case of the two) are inconsistent with that of *In re Warmerdam*. The Court in *In re Waremerdam* addresses a pertinent quote, stating, "Despite the oft-quoted statement in the legislative history of the 1952 Patent Act that Congress intended that statutory subject matter 'include anything under the sun that is made by man,'...Congress did not so mandate." *In re Warmerdam* at 1757. The Court in *State Street Bank* disagrees, stating that, "Indeed, the Supreme Court has acknowledged that Congress intended § 101 to extend to 'anything under the sun that is made by man.' " This quote is VERY pertinent to an understanding of what constitutes a "useful, concrete and tangible" result. Thus, the Examiner's conclusion that the holding of *In re Warmerdam* is within the *State Street Bank* line of cases is incorrect. As stated above, the Court in *In re Warmerdam* does not take the same view of "useful, concrete and tangible" that the Court makes in *State Street Bank*.

Third, the Examiner attempts to bootstrap the *In re Warmerdam* case by stating that the subsequent cases of *State Street Bank* and *AT&T v. Excel* all "make clear" the holding in *In re Warmerdam* and that they are "within the same line of cases" as *In re Warmerdam* and further "validated" *In re Warmerdam*. See pages 2, 5, and 6 of the Final Office Action. This is simply not true. The *AT&T v. Excel* quote near the top of page 2 of the Final Office Action is merely a fragment of the larger quote set forth on page 6. In the larger quote, the Court concludes that "Whether one agrees with the court's conclusion on the fact..." See page 6 of the Final Office Action. The Court's statement in *AT&T v. Excel* delineates the applicable law from the potentially erroneous reasoning of *In re Warmerdam*, indicating that the Court's conclusion in *In re Warmderam* should be taken with a grain of salt. More

specifically, the Court in *AT&T v. Excel* was saying that the statement of law in *In re Warmerdam*, that "laws of nature, natural phenomenon, and abstract ideas" are not patentable, is correct. It was not saying that its conclusion based upon the facts was correct.

As indicated above, the Examiner used *In re Warmderdam* in rejecting Claims 1-66 under 35 U.S.C. § 101, stating that the claims do not produce a "useful, concrete, and tangible" result. However, contrary to the Examiner's contentions, *In re Warmderam* is neither consistent with nor supported by current case law. It should also be noted that both *State Street Bank* and *AT&T v. Excel* are more recent than *In re Warmerdam* and both address the issue at hand, a rejection under Section 101. Hence, this is more of a *State Street Bank* or *AT&T v. Excel* analysis than the *In re Warmerdam* analysis that the Examiner relies upon.

b. <u>Claims 1-66 are patentable under 35 U.S.C. §101 as providing a useful, concrete, and tangible result</u>

35 U.S.C. Section 101, reads, "Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title." The Court in *AT&T v. Excel* clarified the scope of Section 101, stating that "The Supreme Court has construed Section 101 broadly, noting that Congress intended statutory subject matter to 'include anything under the sun that is made by man.' (quoting *Diamond v. Chakrabarty,* 447 U.S. 303, 309). Despite this seemingly limitless expanse, the Court has specifically identified three categories of unpatentable subject matter: 'laws of nature, natural phenomena, and abstract ideas.' " *AT&T v. Excel* at 1449, 1450.

Additionally, "[b]ecause Section 101 includes processes as a category of patentable subject matter, the judicially-defined proscription against patenting of a 'mathematical algorithm,' to the extent such a proscription still exists, is narrowly limited to mathematical algorithms in the abstract." *AT&T v. Excel* at 1450. The Courts in *State Street* and *AT&T v. Excel* recently addressed the "mathematical

algorithm" exception, concluding that "[u]npatentable mathematical algorithms are identifiable by showing they are merely abstract ideas constituting disembodied concepts or truths that are not 'useful.'... [T]o be patentable an algorithm must be applied in a 'useful' way." (quoting *State Street Bank* at 1601)." *AT&T v. Excel* at 1451. In that case, the Court stated that a "claimed data processing system for implementing a financial management structure satisfied the Section 101 inquiry because it constituted a 'practical application of a mathematical algorithm,... [by] produc[ing] a useful, concrete and tangible result.' " *Id.* at 1451 (emphasis added).

The *State Street Bank* formulation that a mathematical algorithm may be an integral part of patentable subject matter (such as a machine or process) if the claimed invention as a whole is applied in a "useful" manner, follows the approach taken in *In re Alappat*, 33 F.3d 1526, 31 USPQ2d 1545 (Fed. Cir. 1994).

In *Alappat*, the Court concluded that "[it] never intended to create an overly broad, fourth category of [mathematical] subject matter excluded from Section 101. Rather, at the core of the Court's analysis... lies an attempt by the Court to explain a rather straightforward concept, namely, that certain types of mathematical subject matter, standing alone, represent nothing more than abstract ideas until reduced to some type of practical application, and thus that subject matter is not, in and of itself, entitled to patent protection. *Id.* at 1543, 31 USPQ2d at 1556 (emphasis added)." *AT&T v. Excel* at 1451.

Thus, as confirmed by the Courts in both *State Street Bank* and *AT&T v. Excel*, "the *Alappat* inquiry simply requires an examination of the contested claims to see if the claimed subject matter as a whole is a disembodied mathematical concept representing nothing more than a 'law of nature' or an 'abstract idea,' or if the mathematical concept has been reduced to some practical application rendering it 'useful.' *Id.* at 1544, 31 USPQ2d at 1557." *AT&T v. Excel* at 1451.

As an example of a useful, practical application, the Court in *AT&T v. Excel* cited the holding in *Alappat*, where the Court held that more than an abstract idea

was claimed because the claimed invention as a whole was directed toward using a machine to produce a useful, concrete, and tangible result of a smooth waveform display. *AT&T v. Excel* at 1451. The Court in *State Street Bank* further elaborated on *Alappat*, stating that the data, transformed by a machine through a series of mathematical calculations to produce a smooth waveform, constituted a practical application of an abstract idea, because it produced a "useful, concrete, and tangible" result, the smooth waveform. *State Street Bank* at 1601 (emphasis added). Thus, as confirmed by both *State Street Bank* and *AT&T v. Excel*, the "transformation" of data provides a practical application and is patentable under Section 101.

The Court in *AT&T v. Excel* further clarified "transformation," citing the Supreme Court's ruling in *Diamond v. Dieh*, 450 U.S. 175 (1981), when it stated that "when [a claimed invention] is performing a function which the patent laws were designed to protect (e.g., transforming or reducing an article to a different state or thing), then the claim satisfies the requirements of Section 101." *AT&T v. Excel* at 1452.

The Court then confirmed such a practical application by providing a specific example of such a transformation of data. In *Arrhythmia Research Tech. v. Corazonix Corp.*, the "process claims included various mathematical formulae to analyze electrocardiograph signals to determine a specified heart activity. The *Arrhythmia* Court reasoned that the method claims qualified as statutory subject matter by noting that the steps transformed physical, electrical signals from one form into another form – a number representing a signal related to the patient's heart activity, a non-abstract output...The finding that the claimed process "transformed" data from one "form" to another simply confirmed that Arrhythmia's method claims satisfied Section 101 because the mathematical algorithm included within the process was applied to produce a number which had specific meaning – a useful, concrete, tangible result – not a mathematical abstraction." *AT&T v. Excel at 1452* (citing *Arrhythmia Research Tech. v. Corazonix Corp.* 958 F.2d 1053, 1059-1060 (Fed. Cir. 1992) (emphasis added).

The courts holding in *State Street Bank* further validates the reasoning above. In *State Street Bank*, the Court held that "the transformation of data, representing discrete dollar amounts, by a machine through a series of mathematical calculations into a final share price, constitutes a practical application of a mathematical algorithm, formula, or calculation, because it produces 'a useful, concrete and tangible result' – a final share price." *State Street Bank* at 1601. Thus, "this renders it statutory subject matter, even if the useful result is expressed in numbers, such as price, profit, percentage, cost or loss." *Id.* at 1602.

Therefore, as very clearly outlined above, a process that transforms data to produce a useful number, such as a percentage (e.g., probability), is considered statutory subject matter and patentable under Section 101.

As applied to the Present Application, independent Claims 1, 23, and 45 describe a process for transforming decision flowcharts into "decision probabilistic graphs." The decision probabilistic graphs enable a user to create powerful graphical probabilistic models in order to produce better decision procedures.

Each of the independent claims (i.e., Claims 1, 23, and 45) include the limitations of:

"...receiving a representation of a decision flowchart having evidence nodes, a root evidence node, and outcome nodes, where the outcome nodes are related to the evidence nodes by conclusion links;

generating a probabilistic graph based on the decision flowchart, including:

an aggregate outcome node having a plurality of outcome states, with each outcome state representing an outcome node of the decision flowchart;

a plurality of test nodes with each of the test nodes matching an evidence node in the decision flowchart, and each test state matching a conclusion link from the evidence node in the flowchart;

causal links between the aggregate outcome node and the evidence nodes;

calculating a set of prior probabilities for the outcome states; and

determining conditional probabilities for all test states by examining dependencies of conclusion links on the outcome nodes in the decision flowchart." (Emphasis Added).

As evident above, the invention according to the Present Application does not merely manipulate abstract ideas and does in fact provide a "useful, concrete and tangible" result. The claims include receiving a "decision flowchart," having evidence nodes, a root evidence node, and outcome nodes, and generating "decision probabilistic graphs," that include an aggregate outcome node, a plurality of test nodes and causal links between the aggregate outcome node and the evidence nodes. The "decision probabilistic graphs" are "discrete" decision making tools and the process is more than a manipulation of abstract ideas but a transformation of the discrete decision flowcharts to a useful, concrete and tangible result (i.e., the decision probabilistic graphs). "Probabilistic graphs" are themselves concrete and useful tools (used to make decisions) and not mere abstractions. Finally, conditional probabilities are determined, which are in of themselves, useful, concrete, and tangible numerical values.

Additionally, as clearly stated in the Present Application, "[t]he immediate benefits include flexibility of use in diagnosis, easy updating by learning, and the ability to cover cost of observations and multiple faults. This tool has application in any field where decisions are applied, non-limiting examples of which include diagnosing problems with machinery, such as cars, trucks, planes, boats, and trains, as well as with other problem types, such as computer network communications, satellite diagnostics, etc." (See the Present Application, paragraph 53). In particular, diagnostic services are desirable for many systems. The invention allows a user to generate probabilistic graphs and determine the conditional probabilities for all test states. In other words, and as described in the Present Application, a user can assess the probability (i.e., conditional probability) that a particular observation will occur (e.g., the failure for a given node such as a component) given certain pieces of existing evidence (e.g., such as the condition of another component).

One skilled in the art cannot dispute that the ability to determine the probability of a particular observation (e.g., failure) is a useful, concrete, and tangible result.

In fact, using the reasoning stated in the *State Street Bank* decision, those skilled in the art rely upon the conditional probabilities in order to make decisions, such as to repair, replace, abort, and/or continue use of components of a system. The ability to predict an observation and diagnose a system, until now, has been done using simple flow charts. The present invention improves upon the prior art by converting decision flow charts into decision probabilistic graphs that enable a user to create powerful graphical probabilistic models in order to produce better decision procedures. The invention according to the Present Application is not merely a manipulation of an abstract idea but, for example, a method for determining probabilities of predicted observations, clearly a useful, concrete, and tangible result.

Going to the notion of what is "abstract," the Examiner defined the "decision flowcharts" as "abstract" on page 5 of the Final Office Action. Figure 4 of the Present Application is such a flowchart. Figure 4 is a concrete and tangible chart. A tangible chart is not an abstract idea and is in fact a patentable feature. For example, a search through issued patents on the U.S. Patent and Trademark Office's search engine, looking for the term "flowchart" in the claims, retrieved multiple references. For "flowchart" alone, there were 63 patents where that term was used in the claims. Additionally, for a "probability graph" (which Figure 5 is an example of), there were two patents having the term "probability graph" in the claims. Thus, flowcharts and probability graphs are not mere abstract ideas, but actual patentable features that the USPTO has previously acknowledged as not being abstract ideas.

On page 5 of the Final Office Action, the Examiner claims that a decision flowchart is "provably even more abstract... than pure 'mathematical algorithms' which the Supreme Court has held as per se nonstutory." However, as stated in

AT&T v. Excel, and quoting from the Supreme Court's decision in, *Alappat*, "[The Court] never intended to create an overly broad, fourth category of [mathematical] subject matter excluded from § 101. Rather, at the core of the Court's analysis . . . lies an attempt by the Court to explain a rather straightforward concept, namely, that certain types of mathematical subject matter, standing alone, represent nothing more than abstract ideas until reduced to some type of practical application, and thus that subject matter is not, in and of itself, entitled to patent protection." With respect to the Present Application, nothing is "standing alone" as the invention utilizes concrete flow charts that are converted (transformed) into concrete graphs on a data processing system.

More specifically, the invention of the Present Application includes a process that transforms data to generate a graph (i.e., probabilistic graph) and numbers (i.e., conditional probabilities) with a specific meaning (i.e., the likelihood that a particular observation will occur) and not an abstraction. As was held by both *AT&T v. Excel* and *Arrhythmia Research Tech.*, when a method claims a process that produces a number which has a specific meaning, the process is not a mere abstraction and satisfies Section 101.

Therefore, as described above, independent Claims 1, 23, and 45 are patentable under 35 U.S.C. § 101, as being directed to statutory subject matter. Thus, the Appellant respectfully requests that the Board withdraw the Examiner's rejection of Claims 1, 23, and 45 under 35 U.S.C. § 101.

Claim 2, dependent on Claim 1, is patentable by virtue of its dependency. Thus, the Appellant respectfully requests that the Board withdraw the Examiner's rejection of Claim 2.

Claim 3, dependent on Claim 1, is patentable by virtue of its dependency. Thus, the Appellant respectfully requests that the Board withdraw the Examiner's rejection of Claim 3.

Claim 4, dependent on Claim 1, is patentable by virtue of its dependency. Thus, the Appellant respectfully requests that the Board withdraw the Examiner's rejection of Claim 4.

Claim 5, dependent on Claim 1, is patentable by virtue of its dependency. Thus, the Appellant respectfully requests that the Board withdraw the Examiner's rejection of Claim 5.

Claim 6, dependent on Claim 1, is patentable by virtue of its dependency. Thus, the Appellant respectfully requests that the Board withdraw the Examiner's rejection of Claim 6.

Claim 7, dependent on Claim 1, is patentable by virtue of its dependency. Thus, the Appellant respectfully requests that the Board withdraw the Examiner's rejection of Claim 7.

Claim 8, dependent on Claim 1, is patentable by virtue of its dependency. Thus, the Appellant respectfully requests that the Board withdraw the Examiner's rejection of Claim 8.

Claim 9, dependent on Claim 1, is patentable by virtue of its dependency. Thus, the Appellant respectfully requests that the Board withdraw the Examiner's rejection of Claim 9.

Claim 10, dependent on Claim 1, is patentable by virtue of its dependency. Thus, the Appellant respectfully requests that the Board withdraw the Examiner's rejection of Claim 10.

Claim 11, dependent on Claim 1, is patentable by virtue of its dependency. Thus, the Appellant respectfully requests that the Board withdraw the Examiner's rejection of Claim 11.

Claim 12, dependent on Claim 1, is patentable by virtue of its dependency. Thus, the Appellant respectfully requests that the Board withdraw the Examiner's rejection of Claim 12.

Claim 13, dependent on Claim 1, is patentable by virtue of its dependency. Thus, the Appellant respectfully requests that the Board withdraw the Examiner's rejection of Claim 13.

Claim 14, dependent on Claim 1, is patentable by virtue of its dependency. Thus, the Appellant respectfully requests that the Board withdraw the Examiner's rejection of Claim 14.

Claim 15, dependent on Claim 1, is patentable by virtue of its dependency. Thus, the Appellant respectfully requests that the Board withdraw the Examiner's rejection of Claim 15.

Claim 16, dependent on Claim 1, is patentable by virtue of its dependency. Thus, the Appellant respectfully requests that the Board withdraw the Examiner's rejection of Claim 16.

Claim 17, dependent on Claim 1, is patentable by virtue of its dependency. Thus, the Appellant respectfully requests that the Board withdraw the Examiner's rejection of Claim 17.

Claim 18, dependent on Claim 1, is patentable by virtue of its dependency. Thus, the Appellant respectfully requests that the Board withdraw the Examiner's rejection of Claim 18.

Claim 19, dependent on Claim 1, is patentable by virtue of its dependency. Thus, the Appellant respectfully requests that the Board withdraw the Examiner's rejection of Claim 19.

Claim 20, dependent on Claim 1, is patentable by virtue of its dependency. Thus, the Appellant respectfully requests that the Board withdraw the Examiner's rejection of Claim 20.

Claim 21, dependent on Claim 1, is patentable by virtue of its dependency. Thus, the Appellant respectfully requests that the Board withdraw the Examiner's rejection of Claim 21.

Claim 22, dependent on Claim 1, is patentable by virtue of its dependency. Thus, the Appellant respectfully requests that the Board withdraw the Examiner's rejection of Claim 22.

Claim 24, dependent on Claim 23, is patentable by virtue of its dependency. Thus, the Appellant respectfully requests that the Board withdraw the Examiner's rejection of Claim 24.

Claim 25, dependent on Claim 23, is patentable by virtue of its dependency. Thus, the Appellant respectfully requests that the Board withdraw the Examiner's rejection of Claim 25.

Claim 26, dependent on Claim 23, is patentable by virtue of its dependency. Thus, the Appellant respectfully requests that the Board withdraw the Examiner's rejection of Claim 26.

Claim 27, dependent on Claim 23, is patentable by virtue of its dependency. Thus, the Appellant respectfully requests that the Board withdraw the Examiner's rejection of Claim 27.

Claim 28, dependent on Claim 23, is patentable by virtue of its dependency. Thus, the Appellant respectfully requests that the Board withdraw the Examiner's rejection of Claim 28.

Claim 29, dependent on Claim 23, is patentable by virtue of its dependency. Thus, the Appellant respectfully requests that the Board withdraw the Examiner's rejection of Claim 29.

Claim 30, dependent on Claim 23, is patentable by virtue of its dependency. Thus, the Appellant respectfully requests that the Board withdraw the Examiner's rejection of Claim 30.

Claim 31, dependent on Claim 23, is patentable by virtue of its dependency. Thus, the Appellant respectfully requests that the Board withdraw the Examiner's rejection of Claim 31.

Claim 32, dependent on Claim 23, is patentable by virtue of its dependency. Thus, the Appellant respectfully requests that the Board withdraw the Examiner's rejection of Claim 32.

Claim 33, dependent on Claim 23, is patentable by virtue of its dependency. Thus, the Appellant respectfully requests that the Board withdraw the Examiner's rejection of Claim 33.

Claim 34, dependent on Claim 23, is patentable by virtue of its dependency. Thus, the Appellant respectfully requests that the Board withdraw the Examiner's rejection of Claim 34.

Claim 35, dependent on Claim 23, is patentable by virtue of its dependency. Thus, the Appellant respectfully requests that the Board withdraw the Examiner's rejection of Claim 35.

Claim 36, dependent on Claim 23, is patentable by virtue of its dependency. Thus, the Appellant respectfully requests that the Board withdraw the Examiner's rejection of Claim 36.

Claim 37, dependent on Claim 23, is patentable by virtue of its dependency. Thus, the Appellant respectfully requests that the Board withdraw the Examiner's rejection of Claim 37.

Claim 38, dependent on Claim 23, is patentable by virtue of its dependency. Thus, the Appellant respectfully requests that the Board withdraw the Examiner's rejection of Claim 38.

Claim 39, dependent on Claim 23, is patentable by virtue of its dependency. Thus, the Appellant respectfully requests that the Board withdraw the Examiner's rejection of Claim 39.

Claim 40, dependent on Claim 23, is patentable by virtue of its dependency. Thus, the Appellant respectfully requests that the Board withdraw the Examiner's rejection of Claim 40.

Claim 41, dependent on Claim 23, is patentable by virtue of its dependency. Thus, the Appellant respectfully requests that the Board withdraw the Examiner's rejection of Claim 41.

Claim 42, dependent on Claim 23, is patentable by virtue of its dependency. Thus, the Appellant respectfully requests that the Board withdraw the Examiner's rejection of Claim 42.

Claim 43, dependent on Claim 23, is patentable by virtue of its dependency. Thus, the Appellant respectfully requests that the Board withdraw the Examiner's rejection of Claim 43.

Claim 44, dependent on Claim 23, is patentable by virtue of its dependency. Thus, the Appellant respectfully requests that the Board withdraw the Examiner's rejection of Claim 44.

Claim 46, dependent on Claim 45, is patentable by virtue of its dependency. Thus, the Appellant respectfully requests that the Board withdraw the Examiner's rejection of Claim 46.

Claim 47, dependent on Claim 45, is patentable by virtue of its dependency. Thus, the Appellant respectfully requests that the Board withdraw the Examiner's rejection of Claim 47.

Claim 48, dependent on Claim 45, is patentable by virtue of its dependency. Thus, the Appellant respectfully requests that the Board withdraw the Examiner's rejection of Claim 48.

Claim 49, dependent on Claim 45, is patentable by virtue of its dependency. Thus, the Appellant respectfully requests that the Board withdraw the Examiner's rejection of Claim 49.

Claim 50, dependent on Claim 45, is patentable by virtue of its dependency. Thus, the Appellant respectfully requests that the Board withdraw the Examiner's rejection of Claim 50.

Claim 51, dependent on Claim 45, is patentable by virtue of its dependency. Thus, the Appellant respectfully requests that the Board withdraw the Examiner's rejection of Claim 51.

Claim 52, dependent on Claim 45, is patentable by virtue of its dependency. Thus, the Appellant respectfully requests that the Board withdraw the Examiner's rejection of Claim 52.

Claim 53, dependent on Claim 45, is patentable by virtue of its dependency. Thus, the Appellant respectfully requests that the Board withdraw the Examiner's rejection of Claim 53.

Claim 54, dependent on Claim 45, is patentable by virtue of its dependency. Thus, the Appellant respectfully requests that the Board withdraw the Examiner's rejection of Claim 54.

Claim 55, dependent on Claim 45, is patentable by virtue of its dependency. Thus, the Appellant respectfully requests that the Board withdraw the Examiner's rejection of Claim 55.

Claim 56, dependent on Claim 45, is patentable by virtue of its dependency. Thus, the Appellant respectfully requests that the Board withdraw the Examiner's rejection of Claim 56.

Claim 57, dependent on Claim 45, is patentable by virtue of its dependency. Thus, the Appellant respectfully requests that the Board withdraw the Examiner's rejection of Claim 57.

Claim 58, dependent on Claim 45, is patentable by virtue of its dependency. Thus, the Appellant respectfully requests that the Board withdraw the Examiner's rejection of Claim 58.

Claim 59, dependent on Claim 45, is patentable by virtue of its dependency. Thus, the Appellant respectfully requests that the Board withdraw the Examiner's rejection of Claim 59.

Claim 60, dependent on Claim 45, is patentable by virtue of its dependency. Thus, the Appellant respectfully requests that the Board withdraw the Examiner's rejection of Claim 60.

Claim 61, dependent on Claim 45, is patentable by virtue of its dependency. Thus, the Appellant respectfully requests that the Board withdraw the Examiner's rejection of Claim 61.

Claim 62, dependent on Claim 45, is patentable by virtue of its dependency. Thus, the Appellant respectfully requests that the Board withdraw the Examiner's rejection of Claim 62.

Claim 63, dependent on Claim 45, is patentable by virtue of its dependency. Thus, the Appellant respectfully requests that the Board withdraw the Examiner's rejection of Claim 63.

Claim 64, dependent on Claim 45, is patentable by virtue of its dependency. Thus, the Appellant respectfully requests that the Board withdraw the Examiner's rejection of Claim 64.

Claim 65, dependent on Claim 45, is patentable by virtue of its dependency. Thus, the Appellant respectfully requests that the Board withdraw the Examiner's rejection of Claim 65.

Claim 66, dependent on Claim 45, is patentable by virtue of its dependency. Thus, the Appellant respectfully requests that the Board withdraw the Examiner's rejection of Claim 66.

Issue 2 *–Are Claims 1-66 patentable under 35 U.S.C. § 112, first paragraph, as enabling one of ordinary skill in the art to use the invention?*

In the Final Office Action of August 23, 2006, the Examiner rejected Claims 1-66 as being unpatentable under 35 U.S.C. § 112, first paragraph.

The Examiner's Contentions

In rejecting Claims 1-66 under Section 112, the Examiner stated that current case law requires such a rejection if a Section 101 rejection was made. The Examiner reasoned that if Appellant has not disclosed the *practical application* for the invention, there is no way Appellant could have disclosed *how* to practice the *undisclosed* practical application.

The Appellant's Response

The Appellant submits that the Examiner misinterpreted the application and that Claims 1-66 comply with the requirements of 35 U.S.C. § 101 and therefore also comply with the requirements of Section 112. As discussed at length above, Claims 1-66 are patentable under Section 101. Thus, the Examiner's reasoning with respect to this rejection is faulty and, therefore, Claims 1-66 are also patentable under Section 112. Thus, the Appellant respectfully requests that the Board withdraw the Examiner's rejection of Claims 1-66 under Section 112.

Issue 3 *– Are Claims 1, 23, and 45 patentable under 35 U.S.C. § 112, first paragraph, as being fully enabled to operate as Appellant claims?*

The Examiner rejected Claims 1, 23, and 45 under 35 U.S.C. § 112, first paragraph.

The Examiner's Contentions

Regarding Claims 1, 23, and 45, the Examiner stated that the claims are not fully enabled to operate as Appellant claims. For instance, the Examiner stated that the claims recite that conditional probabilities are determined for all test states by "examining dependencies of conclusion links on the outcome nodes in the decision flowchart." The Examiner also stated that the Appellant has not disclosed from where these probabilities actually come. More specifically, the Examiner stated that the Appellant has not disclosed any limitations to a practical application, so no one of ordinary skill in the art can look at a network that has not been applied to anything and pull the probabilities out of thin air.

The Examiner further contends that no one can simply "examine" the dependencies of an abstract concept and know probabilities that are appropriate, and that a limitation to a practical application must be disclosed.

In response to Appellant's previous arguments, the Examiner clarified the above contentions by stating that the "*Examiner did not mean that the claimed invention was not capable of being examined, but mean that mere inspection of an abstract Bayesian network, without disclosure of a practical application, does not allow one of ordinary skill in the art to know what probabilities are appropriate...that is, how to practice the unknown practical application.*"

Additionally, the Examiner stated that the Appellant does not specify the central "conversion process" that takes one from a decision flowchart to a causality graph. Instead, the Examiner contends that the Appellant merely defines the decision flowchart in terms of the results of the conversion process. Based on that, the Examiner concludes that no one of ordinary skill in the art would imply a specific conversion method from this.

In response to Appellant's previous arguments, the Examiner clarified the above contentions regarding the conversion process, by stating that the example in the specification "*...can't be used to limit the claims to a practical application. Further, the citations from the specification cannot be read into the claims.*"

The Appellant's Response

Regarding enablement, the Appellant directs the Board to discussion above regarding ***Issue 1*** and to paragraphs 54-60 of the Present Application. As stated above, by transforming decision flowcharts into probabilistic graphs and conditional probabilities, the practical application is the ability to determine the probability that a particular observation will occur (e.g., failure of a node/component) given the occurrence of a particular observation (e.g., failure of another component). As held by *AT&T v. Excel*, transforming data to a specific number is a useful and practical limitation. In this case, the specific number provides a likelihood that a particular observation will occur. Thus, depending upon the particular decision flowchart, the probabilities naturally follow and would clearly be obtainable by one skilled in the art.

Regarding the central "conversion process" and how it takes one from a decision flowchart to a causality graph, the Examiner misinterprets the claims. The term "conversion process" is not an element in the claims. Rather, the claims recite a process for converting decision flowcharts into decision probabilistic graphs. The claims clearly describe the process, including the acts of:

receiving a representation of a decision flowchart...

generating a probabilistic graph based on the decision flowchart....

calculating a set of prior probabilities....and

determining conditional probabilities...

The claims, in of themselves, describe the acts for converting the decision flowcharts into decision probabilistic graphs. Additionally, the claims are to be interpreted in light of the specification. Thus, the specification further describes examples of the acts listed in the claims. For example, Figure 4 is an example of the steps used to convert a flow chart into a graphical probabilistic model. Paragraphs 56 through 60 of the Present Application continue by specifying the central conversion process that takes one from a decision flowchart to a causality graph. As it is explicitly described in the Present Application, one skilled in the art would clearly understand the specific conversion method.

As discussed at length above, Claims 1, 23, and 45 are patentable under Section 101 and therefore provide a practical application. Additionally, for the reasons set forth above, the claims enable one skilled in the art to practice the invention. Thus, the Appellant respectfully requests that the Board withdraw the Examiner's rejection of Claims 1, 23, and 45 under Section 112.

Issue 4 *– Are Claims 2, 24, and 46 patentable under 35 U.S.C. § 112, first paragraph, as being fully enabled to operate as Appellant claims?*

The Examiner rejected Claims 2, 24, and 46 under 35 U.S.C. § 112, first paragraph.

The Examiner's Contentions

The Examiner stated that although the claims disclose the use of a "Flowchart Markup Language (FCML)," no such language is known in the art. The Examiner offered evidence of his contention by stating that there are no other references to such a thing on the internet through Google. The Examiner continued by stating that there is no definition of the parameters of such a language in the Specification, and that the so-called "FCML" is merely an abstract idea with no definition. Thus, the Examiner concluded that no one of ordinary skill in the art

would know how to practice this part of the invention, since it is completely unknown in the art.

The Appellant's Response

The Appellant directs the Board to paragraph 46, where it clearly states, "the file may be converted to a portable file type 106 using an approach such as an extensible markup language (XML)-based language, termed a flow-chart markup language (FCML)." Contrary to the Examiner's assertion, XML is a commonly known term to one skilled in the art. The primary purpose of XML is to facilitate the sharing of data across different systems. As applied to the present invention, "After a flowchart is created, it is exported to a computer file 102. The computer file 102 may be in a format native to the program from which it was created, a "portable" format, or any other computer representation. After the computer file 102 has been created, it is provided to a translator 104. After translation, the file may be converted to a portable file type 106 using an approach such as a ...XML-based language, termed ...FCML." See Specification, paragraph 51. The term FCML was used because it is based on an XML language and is being applied specifically to encode information about a flowchart.

Additionally, it is well known in the art that a patent applicant is allowed to be his own lexicographer. The fact that "no such language is known to the art" is irrelevant if, as is the case here, the Appellant is creating his own words. Based on the description above and as verified by the Appellant, one skilled in the art would clearly understand the use of the term FCML.

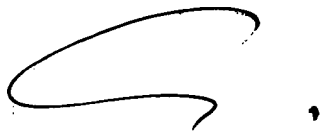
Therefore, as described above, Claims 2, 24, and 46 are patentable under 35 U.S.C. § 112, first paragraph, as enabling one of ordinary skill in the art to use the invention. Thus, the Appellant respectfully requests that the Board withdraw the Examiner's rejection of Claims 2, 24, and 46 under 35 U.S.C. § 112, first paragraph.

CONCLUSION

For the extensive reasons advanced above, the Appellant respectfully contends that each claim is patentable. Therefore, withdrawal of all rejections is courteously solicited.

To the extent necessary, a petition for an extension of time under 37 CFR 1.136 is hereby made. Please charge any shortage of fees due in connection with the filing of this paper, including extension of time fees, to deposit account no. 50-2691 and please credit any excess fees to such deposit account.

Respectfully submitted,



03/23/07
Date

Cary Tope-McKay
Registration No. 41,350

Cary Tope-McKay
TOPE-MCKAY & ASSOCIATES
23852 Pacific Coast Hwy. #311
Malibu, CA 90265
Tel: 310.589.8158
Mobile: 310.383.7468
Fax: 310-943-2736
E-mail: cmckay@topemckay.com

Encl:
Claims Appendix
Evidence Appendix
Related Proceeding Appendix

CLAIMS APPENDIX

1. (Original) A method for converting decision flowcharts into decision probabilistic graphs on a data processing system, comprising steps of: receiving a representation of a decision flowchart having evidence nodes, a root evidence node, and outcome nodes, where the outcome nodes are related to the evidence nodes by conclusion links; generating a probabilistic graph based on the decision flowchart, including: an aggregate outcome node having a plurality of outcome states, with each outcome state representing an outcome node of the decision flowchart; a plurality of test nodes with each of the test nodes matching an evidence node in the decision flowchart, and each test state matching a conclusion link from the evidence node in the flowchart; causal links between the aggregate outcome node and the evidence nodes; calculating a set of prior probabilities for the outcome states; and determining conditional probabilities for all test states by examining dependencies of conclusion links on the outcome nodes in the decision flowchart.

2. (Original) A method for converting decision flowcharts into decision probabilistic graphs on a data processing system as set forth in claim 1, wherein the representation of the decision flowchart is obtained as a Flowchart Markup Language (FCML) document containing the essence of the decision flowchart.

3. (Original) A method for converting decision flowcharts into decision probabilistic graphs on a data processing system as set forth in claim 2, wherein the graphical representation of the decision flowchart is a Bayesian Network (BN).

4. (Original) A method for converting decision flowcharts into decision probabilistic graphs on a data processing system as set forth in claim 3, wherein in the step of calculating a set of conditional probabilities, a sub-step of generating a causal dependency table comprising a causal dependency of each test node on each outcome state is performed.

5. (Original) A method for converting decision flowcharts into decision probabilistic graphs on a data processing system as set forth in claim 4, wherein the causal dependency table includes a separate column for each outcome node of the decision flowchart and a separate row for each evidence node of the decision flowchart; whereby aggregate entries of each column of the table trace a path from the root evidence node to a particular outcome node.

6. (Original) A method for converting decision flowcharts into decision probabilistic graphs on a data processing system as set forth in claim 5,

wherein the step of determining conditional probabilities further comprises a sub-step of: generating, for each evidence node, a conditional probability table comprising the conditional probability of each test state given each outcome state.

7. (Original) A method for converting decision flowcharts into decision probabilistic graphs on a data processing system as set forth in claim 6, further comprising a step of: generating a model file for the probabilistic graph to an algorithmic engine for further processing.

8. (Original) A method for converting decision flowcharts into decision probabilistic graphs on a data processing system as set forth in claim 7, wherein the predetermined likelihoods are inputted based on observed statistics.

9. (Original) A method for converting decision flowcharts into decision probabilistic graphs on a data processing system as set forth in claim 8, comprising a further step of determining a next piece of evidence to gather based on cost-of-evidence data.

10. (Original) A method for converting decision flowcharts into decision probabilistic graphs on a data processing system as set forth in claim 9, comprising a further step of generating a representation of the decision flowchart via graphing software for receipt in the receiving step.

11. (Original) A method for converting decision flowcharts into decision probabilistic graphs on a data processing system as set forth in claim 10, comprising a further step of generating a user interface to accept user input to the algorithmic engine whereby the user can control the order in which evidence is collected.

12. (Original) A method for converting decision flowcharts into decision probabilistic graphs on a data processing system as set forth in claim 11, further comprising a step of converting the graphical representation of the decision flowchart into a Bayesian network program-specific file.

13. (Original) A method for converting decision flowcharts into decision probabilistic graphs on a data processing system as set forth in claim 1, wherein the graphical representation of the decision flowchart is a Bayesian Network (BN).

14. (Original) A method for converting decision flowcharts into decision probabilistic graphs on a data processing system as set forth in claim 1, wherein in the step of calculating a set of conditional probabilities, a sub-step of generating a causal dependency table comprising a causal dependency of

each test node on each outcome state is performed.

15. (Original) A method for converting decision flowcharts into decision probabilistic graphs on a data processing system as set forth in claim 14, wherein the causal dependency table includes a separate column for each outcome node of the decision flowchart and a separate row for each evidence node of the decision flowchart; whereby aggregate entries of each column of the table trace a path from the root evidence node to a particular outcome node.

16. (Original) A method for converting decision flowcharts into decision probabilistic graphs on a data processing system as set forth in claim 1, wherein the step of determining conditional probabilities further comprises a sub-step of: generating, for each evidence node, a conditional probability table comprising the conditional probability of each test state given each outcome state.

17. (Original) A method for converting decision flowcharts into decision probabilistic graphs on a data processing system as set forth in claim 1, further comprising a step of: generating a model file for the probabilistic graph to an algorithmic engine for further processing.

18. (Original) A method for converting decision flowcharts into decision probabilistic graphs on a data processing system as set forth in claim 1, wherein the predetermined likelihoods are inputted based on observed statistics.

19. (Original) A method for converting decision flowcharts into decision probabilistic graphs on a data processing system as set forth in claim 1, comprising a further step of determining a next piece of evidence to gather based on cost-of-evidence data.

20. (Original) A method for converting decision flowcharts into decision probabilistic graphs on a data processing system as set forth in claim 1, comprising a further step of generating a representation of the decision flowchart via graphing software for receipt in the receiving step.

21. (Original) A method for converting decision flowcharts into decision probabilistic graphs on a data processing system as set forth in claim 1, comprising a further step of generating a user interface to accept user input to the algorithmic engine whereby the user can control the order in which evidence is collected.

22. (Original) A method for converting decision flowcharts into decision probabilistic graphs on a data processing system as set forth in claim 1, further comprising a step of converting the graphical representation of the

decision flowchart into a Bayesian network program-specific file.

23. (Original) A computer program product for converting decision flowcharts into decision probabilistic graphs, the computer program product comprising means, encoded in a computer-readable medium for: receiving a representation of a decision flowchart having evidence nodes, a root evidence node, and outcome nodes, where the outcome nodes are related to the evidence nodes by conclusion links; generating a probabilistic graph based on the decision flowchart, including: an aggregate outcome node having a plurality of outcome states, with each outcome state representing an outcome node of the decision flowchart; a plurality of test nodes with each of the test nodes matching an evidence node in the decision flowchart, and each test state matching a conclusion link from the evidence node in the flowchart; causal links between the aggregate outcome node and the evidence nodes; calculating a set of prior probabilities for the outcome states; and determining conditional probabilities for all test states by examining dependencies of conclusion links on the outcome nodes in the decision flowchart.

24. (Original) A computer program product for converting decision flowcharts into decision probabilistic graphs on a data processing system as set forth in claim 23, wherein the representation of the decision flowchart is obtained as a Flowchart Markup Language (FCML) document containing the essence of the decision flowchart.

25. (Original) A computer program product for converting decision flowcharts into decision probabilistic graphs on a data processing system as set forth in claim 24, wherein the graphical representation of the decision flowchart is a Bayesian Network (BN).

26. (Original) A computer program product for converting decision flowcharts into decision probabilistic graphs on a data processing system as set forth in claim 25, wherein the means for calculating a set of conditional probabilities includes means for generating a causal dependency table comprising a causal dependency of each test node on each outcome state is performed.

27. (Original) A computer program product for converting decision flowcharts into decision probabilistic graphs on a data processing system as set forth in claim 26, wherein the causal dependency table includes a separate column for each outcome node of the decision flowchart and a separate row for each evidence node of the decision flowchart; whereby aggregate entries of each column of the table trace a path from the root evidence node to a particular outcome node.

28. (Original) A computer program product for converting decision flowcharts into decision probabilistic graphs on a data processing system as set forth in

claim 27, wherein the means for determining conditional probabilities further includes means for: generating, for each evidence node, a conditional probability table comprising the conditional probability of each test state given each outcome state.

29. (Original) A computer program product for converting decision flowcharts into decision probabilistic graphs on a data processing system as set forth in claim 28, further comprising means for: generating a model file for the probabilistic graph to an algorithmic engine for further processing.

30. (Original) A computer program product for converting decision flowcharts into decision probabilistic graphs on a data processing system as set forth in claim 29, further comprising means for accepting predetermined likelihoods based on observed statistics.

31. (Original) A computer program product for converting decision flowcharts into decision probabilistic graphs on a data processing system as set forth in claim 30, further comprising means for determining a next piece of evidence to gather based on cost-of-evidence data.

32. (Original) A computer program product for converting decision flowcharts into decision probabilistic graphs on a data processing system as set forth in claim 31, further comprising means for generating a representation of the decision flowchart via graphing software for receipt by the means for receiving.

33. (Original) A computer program product for converting decision flowcharts into decision probabilistic graphs on a data processing system as set forth in claim 32, further comprising means for generating a user interface to accept user input to the algorithmic engine whereby the user can control the order in which evidence is collected.

34. (Original) A computer program product for converting decision flowcharts into decision probabilistic graphs on a data processing system as set forth in claim 33, further comprising means for converting the graphical representation of the decision flowchart into a Bayesian network program-specific file.

35. (Original) A computer program product for converting decision flowcharts into decision probabilistic graphs on a data processing system as set forth in claim 23, wherein the graphical representation of the decision flowchart is a Bayesian Network (BN).

36. (Original) A computer program product for converting decision flowcharts into decision probabilistic graphs on a data processing system as set forth in claim 23, wherein the means for calculating a set of conditional probabilities

further includes means for generating a causal dependency table comprising a causal dependency of each test node on each outcome state is performed.

37. (Original) A computer program product for converting decision flowcharts into decision probabilistic graphs on a data processing system as set forth in claim 36, wherein the causal dependency table includes a separate column for each outcome node of the decision flowchart and a separate row for each evidence node of the decision flowchart; whereby aggregate entries of each column of the table trace a path from the root evidence node to a particular outcome node.

38. (Original) A computer program product for converting decision flowcharts into decision probabilistic graphs on a data processing system as set forth in claim 23, wherein the means for determining conditional probabilities further comprises means for: generating, for each evidence node, a conditional probability table comprising the conditional probability of each test state given each outcome state.

39. (Original) A computer program product for converting decision flowcharts into decision probabilistic graphs on a data processing system as set forth in claim 23, further comprising means for: generating a model file for the probabilistic graph to an algorithmic engine for further processing.

40. (Original) A computer program product for converting decision flowcharts into decision probabilistic graphs on a data processing system as set forth in claim 23, further comprising means for accepting predetermined likelihoods based on observed statistics.

41. (Original) A computer program product for converting decision flowcharts into decision probabilistic graphs on a data processing system as set forth in claim 23, further comprising means for determining a next piece of evidence to gather based on cost-of-evidence data.

42. (Original) A computer program product for converting decision flowcharts into decision probabilistic graphs on a data processing system as set forth in claim 23, further comprising means for generating a representation of the decision flowchart via graphing software for receipt by the means for receiving.

43. (Original) A computer program product for converting decision flowcharts into decision probabilistic graphs on a data processing system as set forth in claim 23, further comprising means for generating a user interface to accept user input to the algorithmic engine whereby the user can control the order in which evidence is collected.

44. (Original) A computer program product for converting decision flowcharts into decision probabilistic graphs on a data processing system as set forth in claim 23, further comprising means for converting the graphical representation of the decision flowchart into a Bayesian network program-specific file.

45. (Original) An apparatus for converting decision flowcharts into decision probabilistic graphs, the apparatus comprising a computer system including a processor, a memory coupled with the processor, an input coupled with the processor for receiving user input and data input, and an output coupled with the processor for outputting display data, wherein the computer system further comprises means, residing in its processor and memory, for: receiving a representation of a decision flowchart having evidence nodes, a root evidence node, and outcome nodes, where the outcome nodes are related to the evidence nodes by conclusion links; generating a probabilistic graph based on the decision flowchart, including: an aggregate outcome node having a plurality of outcome states, with each outcome state representing an outcome node of the decision flowchart; a plurality of test nodes with each of the test nodes matching an evidence node in the decision flowchart, and each test state matching a conclusion link from the evidence node in the flowchart; causal links between the aggregate outcome node and the evidence nodes; calculating a set of prior probabilities for the outcome states; and determining conditional probabilities for all test states by examining dependencies of conclusion links on the outcome nodes in the decision flowchart.

46. (Original) An apparatus for converting decision flowcharts into decision probabilistic graphs on a data processing system as set forth in claim 45, wherein the representation of the decision flowchart is obtained as a Flowchart Markup Language (FCML) document containing the essence of the decision flowchart.

47. (Original) An apparatus for converting decision flowcharts into decision probabilistic graphs on a data processing system as set forth in claim 46, wherein the graphical representation of the decision flowchart is a Bayesian Network (BN).

48. (Original) An apparatus for converting decision flowcharts into decision probabilistic graphs on a data processing system as set forth in claim 47, wherein the means for calculating a set of conditional probabilities includes means for generating a causal dependency table comprising a causal dependency of each test node on each outcome state is performed.

49. (Original) An apparatus for converting decision flowcharts into decision probabilistic graphs on a data processing system as set forth in claim 48, wherein the causal dependency table includes a separate column for each

outcome node of the decision flowchart and a separate row for each evidence node of the decision flowchart; whereby aggregate entries of each column of the table trace a path from the root evidence node to a particular outcome node.

50. (Original) An apparatus for converting decision flowcharts into decision probabilistic graphs on a data processing system as set forth in claim 49, wherein the means for determining conditional probabilities further includes means for: generating, for each evidence node, a conditional probability table comprising the conditional probability of each test state given each outcome state.

51. (Original) An apparatus for converting decision flowcharts into decision probabilistic graphs on a data processing system as set forth in claim 50, further comprising means for: generating a model file for the probabilistic graph to an algorithmic engine for further processing.

52. (Original) An apparatus for converting decision flowcharts into decision probabilistic graphs on a data processing system as set forth in claim 51, further comprising means for accepting predetermined likelihoods based on observed statistics.

53. (Original) An apparatus for converting decision flowcharts into decision probabilistic graphs on a data processing system as set forth in claim 52, further comprising means for determining a next piece of evidence to gather based on cost-of-evidence data.

54. (Original) An apparatus for converting decision flowcharts into decision probabilistic graphs on a data processing system as set forth in claim 53, further comprising means for generating a representation of the decision flowchart via graphing software for receipt by the means for receiving.

55. (Original) An apparatus for converting decision flowcharts into decision probabilistic graphs on a data processing system as set forth in claim 54, further comprising means for generating a user interface to accept user input to the algorithmic engine whereby the user can control the order in which evidence is collected.

56. (Original) An apparatus for converting decision flowcharts into decision probabilistic graphs on a data processing system as set forth in claim 55, further comprising means for converting the graphical representation of the decision flowchart into a Bayesian network program-specific file.

57. (Original) An apparatus for converting decision flowcharts into decision probabilistic graphs on a data processing system as set forth in claim 45, wherein the graphical representation of the decision flowchart is a Bayesian

Network (BN).

58. (Original) An apparatus for converting decision flowcharts into decision probabilistic graphs on a data processing system as set forth in claim 45, wherein the means for calculating a set of conditional probabilities further includes means for generating a causal dependency table comprising a causal dependency of each test node on each outcome state is performed.

59. (Original) An apparatus for converting decision flowcharts into decision probabilistic graphs on a data processing system as set forth in claim 58, wherein the causal dependency table includes a separate column for each outcome node of the decision flowchart and a separate row for each evidence node of the decision flowchart; whereby aggregate entries of each column of the table trace a path from the root evidence node to a particular outcome node.

60. (Original) An apparatus for converting decision flowcharts into decision probabilistic graphs on a data processing system as set forth in claim 45, wherein the means for determining conditional probabilities further comprises means for: generating, for each evidence node, a conditional probability table comprising the conditional probability of each test state given each outcome state.

61. (Original) An apparatus for converting decision flowcharts into decision probabilistic graphs on a data processing system as set forth in claim 45, further comprising means for: generating a model file for the probabilistic graph to an algorithmic engine for further processing.

62. (Original) An apparatus for converting decision flowcharts into decision probabilistic graphs on a data processing system as set forth in claim 45, further comprising means for accepting predetermined likelihoods based on observed statistics.

63. (Original) An apparatus for converting decision flowcharts into decision probabilistic graphs on a data processing system as set forth in claim 45, further comprising means for determining a next piece of evidence to gather based on cost-of-evidence data.

64. (Original) An apparatus for converting decision flowcharts into decision probabilistic graphs on a data processing system as set forth in claim 45, further comprising means for generating a representation of the decision flowchart via graphing software for receipt by the means for receiving.

65. (Original) An apparatus for converting decision flowcharts into decision probabilistic graphs on a data processing system as set forth in claim 45, further comprising means for generating a user interface to accept user input

to the algorithmic engine whereby the user can control the order in which evidence is collected.

66. (Original) An apparatus for converting decision flowcharts into decision probabilistic graphs on a data processing system as set forth in claim 45, further comprising means for converting the graphical representation of the decision flowchart into a Bayesian network program-specific file.

EVIDENCE APPENDIX

None.

RELATED PROCEEDINGS APPENDIX

None.